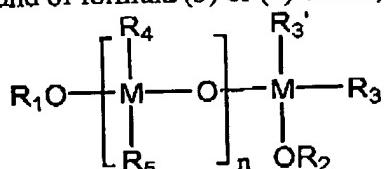


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CLAIM AMENDMENTS

Claims 1-8. (Cancelled)

9. (Previously Presented) A spray-coated layer composition comprising a metal compound of formula (1) below, fluoroalkylsilane of formula (2) below, a mercapto compound of formula (3) or (4) below, and a polar solvent:



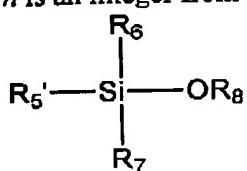
... (1)

where M is selected from the group consisting of Si, Ti, Sn, and Zr;

R₁ is a C₁-C₂₀ alkyl group or -M(R₁₄R₁₅R₁₆) where R₁₄, R₁₅, and R₁₆ are, independently, a C₁-C₂₀ alkyl group, a C₁-C₂₀ alkoxy group, or a C₆-C₂₀ aryl group;

R₂ is a C₁-C₂₀ alkyl group; at least one of R₃ and R_{3'} is a C₁-C₂₀ alkoxy group, and the remaining group is a C₁-C₂₀ alkyl group, a C₁-C₂₀ alkoxy group, a C₂-C₂₀ alkylene group, or a C₆-C₂₀ aryl group; at least one of R₄ and R₅ is a C₁-C₂₀ alkoxy group, and the remaining group is a C₁-C₂₀ alkyl group, a C₂-C₂₀ alkylene group, or a C₆-C₂₀ aryl group; and

n is an integer from 0 to 20,



... (2)

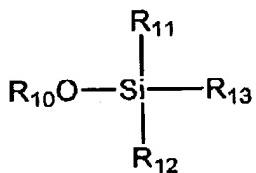
where R_{5'} is a fluorinated C₁-C₂₀ alkyl group; R₆ and R₇ are, independently, a C₁-C₂₀ alkoxy group or a fluorinated C₁-C₂₀ alkyl group; and R₈ is a C₁-C₂₀ alkyl group,

R₉ SH

... (3)

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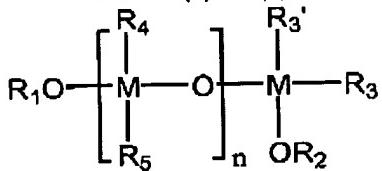
where R_9 is a C_1 - C_{20} alkyl group, a C_1 - C_{20} alkyl group with a hydroxy group, a C_1 - C_{20} hydroxyalkyl group with a hydroxy substituent, or $-(CH_2)_kCOOH$, where k is an integer from 1 to 10, and



... (4)

where R_{10} is a C_1 - C_{20} alkyl group; R_{11} and R_{12} are, independently, a C_1 - C_{20} alkyl group, a C_1 - C_{20} alkoxy group, or a C_1 - C_{20} alkyl group with a mercapto group; and R_{13} is a C_1 - C_{20} alkyl group with a mercapto (-SH) group, wherein the fluoroalkylsilane of said formula (2) is at least one selected from the group consisting of heptadecafluorodecyltriethoxysilane, pentadecafluorohexyltrimethoxysilane, heptadecafluorodecyltrimethoxysilane, heptadecafluorodecyltrisopropoxysilane, heptadecafluorodecyltributoxysilane, di-(heptadecafluorodecyl) diethoxysilane, and tris-(heptadecafluorodecyl)ethoxysilane, and the fluoroalkylsilane of said formula (2) is contained in an amount of 1-15 parts by weight based on 100 parts by weight of the metal compound of formula (1).

10. (Previously Presented) A spray-coated layer composition comprising a metal compound of formula (1) below, fluoroalkylsilane of formula (2) below, a mercapto compound of formula (3) or (4) below, and a polar solvent:



... (1)

where M is selected from the group consisting of Si, Ti, Sn, and Zr;

R_1 is a C_1 - C_{20} alkyl group or $-M(R_{14}R_{15}R_{16})$ where R_{14} , R_{15} , and R_{16} are, independently, a C_1 - C_{20} alkyl group, a C_1 - C_{20} alkoxy group, or a C_6 - C_{20} aryl group;

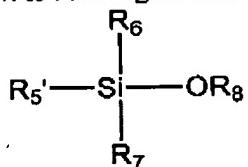
R_2 is a C_1 - C_{20} alkyl group;

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at least one of R₃ and R_{3'} is a C₁-C₂₀ alkoxy group, and the remaining group is a C₁-C₂₀ alkyl group, a C₁-C₂₀ alkoxy group, a C₂-C₂₀ alkylene group, or a C₆-C₂₀ aryl group;

at least one of R₄ and R₅ is a C₁-C₂₀ alkoxy group, and the remaining group is a C₁-C₂₀ alkyl group, a C₂-C₂₀ alkylene group, or a C₆-C₂₀ aryl group; and

n is an integer from 0 to 20,



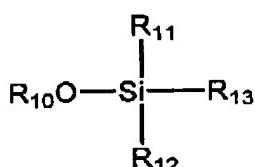
...(2)

where R_{5'} is a fluorinated C₁-C₂₀ alkyl group; R₆ and R₇ are, independently, a C₁-C₂₀ alkoxy group or a fluorinated C₁-C₂₀ alkyl group; and R₈ is a C₁-C₂₀ alkyl group,

R₉ SH

...(3)

where R₉ is a C₁-C₂₀ alkyl group, a C₁-C₂₀ alkyl group with a hydroxy group, a C₁-C₂₀ hydroxyalkyl group with a hydroxy substituent, or -(CH₂)_kCOOH, where k is an integer from 1 to 10, and



...(4)

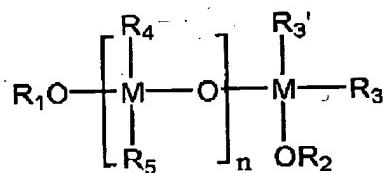
where R₁₀ is a C₁-C₂₀ alkyl group; R₁₁ and R₁₂ are, independently, a C₁-C₂₀ alkyl group, a C₁-C₂₀ alkoxy group, or a C₁-C₂₀ alkyl group with a mercapto group; and R₁₃ is a C₁-C₂₀ alkyl group with a mercapto (-SH) group, wherein the mercapto compound of said formula (3) or (4) is at least one selected from the group consisting of 3-mercaptopropyltrimethoxysilane, 3-mercaptopropylmethyldimethoxysilane, 3-mercato-1,2-propanediol, 1-mercato-2-propanol, 3-mercaptopropionic acid, di-(3-mercaptopropyl)dimethoxysilane, and tris-(3-

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mercaptopropyl)methoxysilane, and the mercapto compound is contained in an amount of 1-15 parts by weight based on 100 parts by weight of the metal compound of said formula (1).

Claims 11-16. (Cancelled)

17. (Previously Presented) A transparent conductive layer comprising a conductive layer containing a metal oxide and a protective layer formed on the conductive layer, the protective layer containing a hydrolyzed and polycondensated product of a metal compound of formula (1) below and at least one of a mercapto compound of formula (3) or (4) below and its hydrolyzed and polycondensated product:



...(1)

where M is selected from the group consisting of Si, Ti, Sn, and Zr;

R₁ is a C₁-C₂₀ alkyl group or -M(R₁₄R₁₅R₁₆) where R₁₄, R₁₅, and R₁₆ are, independently, a C₁-C₂₀ alkyl group, a C₁-C₂₀ alkoxy group, or a C₆-C₂₀ aryl group;

R₂ is a C₁-C₂₀ alkyl group;
at least one of R₃ and R_{3'} is a C₁-C₂₀ alkoxy group, and the remaining group is a C₁-C₂₀ alkyl group, a C₁-C₂₀ alkoxy group, a C₂-C₂₀ alkylene group, or a C₆-C₂₀ aryl group;
at least one of R₄ and R₅ is a C₁-C₂₀ alkoxy group, and the remaining group is a C₁-C₂₀ alkyl group, a C₂-C₂₀ alkylene group, or a C₆-C₂₀ aryl group; and

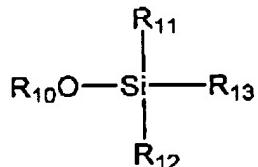
n is an integer from 0 to 20,

R₉ SH

...(3)

where R₉ is a C₁-C₂₀ alkyl group, a C₁-C₂₀ alkyl group with a hydroxy group, a C₁-C₂₀ hydroxalkyl group with a hydroxy substituent, or -(CH₂)_kCOOH, where k is an integer from 1 to 10, and

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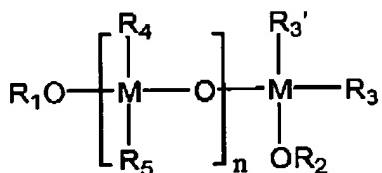


...(4)

where R_{10} is a C_1-C_{20} alkyl group; R_{11} and R_{12} are, independently, a C_1-C_{20} alkyl group, a C_1-C_{20} alkoxy group, or a C_1-C_{20} alkyl group with a mercapto group; and R_{13} is a C_1-C_{20} alkyl group with a mercapto (-SH) group, wherein the mercapto compound of said formula (3) or (4) is at least one selected from the group consisting of 3-mercaptopropyltrimethoxysilane, 3-mercaptopropylmethyldimethoxysilane, 3-mercaptop-1,2-propanediol, 1-mercaptop-2-propanol, 3-mercaptopropionic acid, di-(3-mercaptopropyl)dimethoxysilane, and tris-(3-mercaptopropyl)methoxysilane, and the mercapto compound is contained in an amount of 1-15 parts by weight based on 100 parts by weight of the metal compound of said formula (1).

Claims 18-25. (Cancelled)

26. (Previously Presented) A transparent conductive layer comprising a conductive layer containing a metal oxide and a protective layer and spray-coated layer sequentially formed to protect the conductive layer, the spray-coated layer containing a hydrolyzed and polycondensated product of a metal compound of formula (1) below, at least one of fluoroalkylsilane of formula (2) below and its hydrolyzed and polycondensated product, and at least one of a mercapto compound of formula (3) or (4) below and its hydrolyzed and polycondensated product, and the protective layer containing a hydrolyzed and polycondensated product of the metal compound of said formula (1):



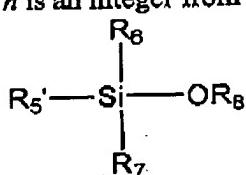
...(1)

where M is selected from the group consisting of Si, Ti, Sn, and Zr;

R_1 is a C_1-C_{20} alkyl group or $-M(R_{14}R_{15}R_{16})$ where R_{14} , R_{15} , and R_{16} are, independently, a C_1-C_{20} alkyl group, a C_1-C_{20} alkoxy group, or a C_6-C_{20} aryl group;

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R_2 is a C_1 - C_{20} alkyl group;
at least one of R_3 and R_3' is a C_1 - C_{20} alkoxy group, and the remaining group is a C_1 - C_{20} alkyl group, a C_1 - C_{20} alkoxy group, a C_2 - C_{20} alkylene group, or a C_6 - C_{20} aryl group;
at least one of R_4 and R_5 is a C_1 - C_{20} alkoxy group, and the remaining group is a C_1 - C_{20} alkyl group, a C_2 - C_{20} alkylene group, or a C_6 - C_{20} aryl group; and
 n is an integer from 0 to 20,

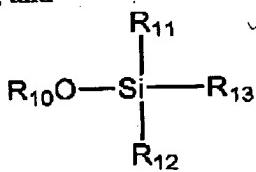


...(2)

where R_5' is a fluorinated C_1 - C_{20} alkyl group; R_6 and R_7 are, independently, a C_1 - C_{20} alkoxy group or a fluorinated C_1 - C_{20} alkyl group; and R_8 is a C_1 - C_{20} alkyl group,



where R_9 is a C_1 - C_{20} alkyl group, a C_1 - C_{20} alkyl group with a hydroxy group, a C_1 - C_{20} hydroxyalkyl group with a hydroxy substituent, or $-(CH_2)_kCOOH$, where k is an integer from 1 to 10, and



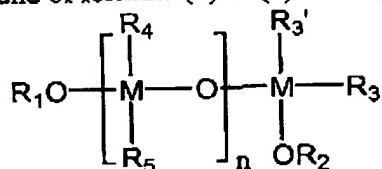
...(4)

where R_{10} is a C_1 - C_{20} alkyl group; R_{11} and R_{12} are, independently, a C_1 - C_{20} alkyl group, a C_1 - C_{20} alkoxy group, or a C_1 - C_{20} alkyl group with a mercapto group; and R_{13} is a C_1 - C_{20} alkyl group with a mercapto (-SH) group, wherein the fluoroalkylsilane of said formula (2) is at least one selected from the group consisting of heptadecafluorodecyltriethoxysilane, pentadecafluorohexyltrimethoxysilane, heptadecafluorodecyltrimethoxysilane, heptadecafluorodecyltriisopropoxysilane, heptadecafluorodecyltributoxysilane, di-(heptadecafluorodecyl) diethoxysilane, and tris-(heptadecafluorodecyl)ethoxysilane, and the fluoroalkylsilane of said formula (2) is contained in an amount of 1-15 parts by weight based on 100 parts by weight of the metal compound of formula (1).

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Claims 27-34. (Cancelled)

35. (Previously Presented) A spray-coated layer composition comprising a metal compound of formula (1) below, fluoroalkylsilane of formula (2) below, a mercapto compound of formula (3) or (4) below, and a polar solvent:



... (1)

where M is selected from the group consisting of Si, Ti, Sn, and Zr;

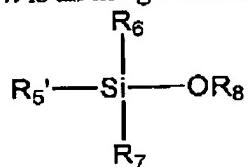
R_1 is a C_1-C_{20} alkyl group or $-M(R_{14}R_{15}R_{16})$ where R_{14} , R_{15} , and R_{16} are, independently, a C_1-C_{20} alkyl group, a C_1-C_{20} alkoxy group, or a C_6-C_{20} aryl group;

R_2 is a C_1-C_{20} alkyl group;

at least one of R_3 and R_3' is a C_1-C_{20} alkoxy group, and the remaining group is a C_1-C_{20} alkyl group, a C_1-C_{20} alkoxy group, a C_2-C_{20} alkylene group, or a C_6-C_{20} aryl group;

at least one of R_4 and R_5 is a C_1-C_{20} alkoxy group, and the remaining group is a C_1-C_{20} alkyl group, a C_2-C_{20} alkylene group, or a C_6-C_{20} aryl group; and

n is an integer from 0 to 20,



... (2)

where R_5' is a fluorinated C_1-C_{20} alkyl group; R_6 and R_7 are, independently, a C_1-C_{20} alkoxy group or a fluorinated C_1-C_{20} alkyl group; and R_8 is a C_1-C_{20} alkyl group,

$R_9 SH$

... (3)

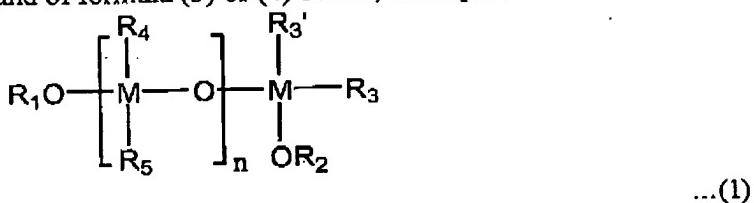
where R_9 is a C_1-C_{20} alkyl group, a C_1-C_{20} alkyl group with a hydroxy group, a C_1-C_{20} hydroxyalkyl group with a hydroxy substituent, or $-(CH_2)_kCOOH$, where k is an integer from 1 to 10, and

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where R_{10} is a C_1 - C_{20} alkyl group; R_{11} and R_{12} are, independently, a C_1 - C_{20} alkyl group, a C_1 - C_{20} alkoxy group, or a C_1 - C_{20} alkyl group with a mercapto group; and R_{13} is a C_1 - C_{20} alkyl group with a mercapto (-SH) group, wherein the fluoroalkylsilane of said formula (2) is at least one selected from the group consisting of heptadecafluorodecyltrioxysilane, pentadecafluorohexyltrimethoxysilane, heptadecafluorodecyltrimethoxysilane, heptadecafluorodecyltriisopropoxysilane, heptadecafluorodecyltributoxysilane, di-(heptadecafluorodecyl)diethoxysilane, and tris-(heptadecafluorodecyl)ethoxysilane.

36. (Previously Presented) A spray-coated layer composition comprising a metal compound of formula (1) below, fluoroalkylsilane of formula (2) below, a mercapto compound of formula (3) or (4) below, and a polar solvent:



where M is selected from the group consisting of Si, Ti, Sn, and Zr;

R_1 is a C_1 - C_{20} alkyl group or $-M(R_{14}R_{15}R_{16})$ where R_{14} , R_{15} , and R_{16} are, independently, a C_1 - C_{20} alkyl group, a C_1 - C_{20} alkoxy group, or a C_6 - C_{20} aryl group;

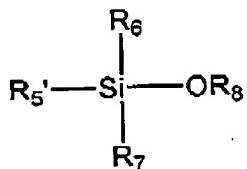
R₂ is a C₁-C₂₀ alkyl group;

at least one of R_3 and R_3' is a C_1 - C_{20} alkoxy group, and the remaining group is a C_1 - C_{20} alkyl group, a C_1 - C_{20} alkoxy group, a C_2 - C_{20} alkylene group, or a C_6 - C_{20} aryl group;

at least one of R₄ and R₅ is a C₁-C₂₀ alkoxy group, and the remaining group is a C₁-C₂₀ alkyl group, a C₂-C₂₀ alkylene group, or a C₆-C₂₀ aryl group; and

n is an integer from 0 to 20.

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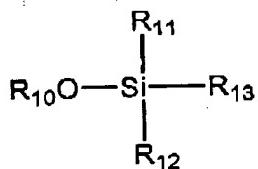
...(2)

where R_5' is a fluorinated C_1 - C_{20} alkyl group; R_6 and R_7 are, independently, a C_1 - C_{20} alkoxy group or a fluorinated C_1 - C_{20} alkyl group; and R_8 is a C_1 - C_{20} alkyl group,



...(3)

where R_9 is a C_1 - C_{20} alkyl group, a C_1 - C_{20} alkyl group with a hydroxy group, a C_1 - C_{20} hydroxyalkyl group with a hydroxy substituent, or $-(CH_2)_kCOOH$, where k is an integer from 1 to 10, and

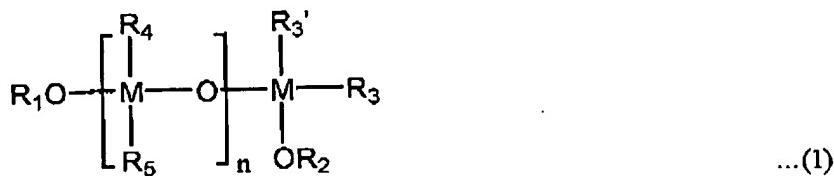


...(4)

where R_{10} is a C_1 - C_{20} alkyl group; R_{11} and R_{12} are, independently, a C_1 - C_{20} alkyl group, a C_1 - C_{20} alkoxy group, or a C_1 - C_{20} alkyl group with a mercapto group; and R_{13} is a C_1 - C_{20} alkyl group with a mercapto (-SH) group, wherein the mercapto compound of said formula (3) or (4) is at least one selected from the group consisting of 3-mercaptopropyltrimethoxysilane, 3-mercaptopropylmethyldimethoxysilane, 3-mercato-1,2-propanediol, 1-mercaptopropanol, 3-mercaptopropionic acid, di-(3-mercaptopropyl)dimethoxysilane, and tris-(3-mercaptopropyl)methoxysilane.

37. (Previously Presented) A transparent conductive layer comprising a conductive layer containing a metal oxide and a protective layer formed on the conductive layer, the protective layer containing a hydrolyzed and polycondensated product of a metal compound of formula (1) below and at least one of a mercapto compound of formula (3) or (4) below and its hydrolyzed and polycondensated product:

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where M is selected from the group consisting of Si, Ti, Sn, and Zr;

R_1 is a C₁-C₂₀ alkyl group or $-M(R_{14}R_{15}R_{16})$ where R_{14} , R_{15} , and R_{16} are, independently, a C₁-C₂₀ alkyl group, a C₁-C₂₀ alkoxy group, or a C₆-C₂₀ aryl group;

R_2 is a C₁-C₂₀ alkyl group;
at least one of R_3 and R_3' is a C₁-C₂₀ alkoxy group, and the remaining group is a C₁-C₂₀ alkyl group, a C₁-C₂₀ alkoxy group, a C₂-C₂₀ alkylene group, or a C₆-C₂₀ aryl group;
at least one of R_4 and R_5 is a C₁-C₂₀ alkoxy group, and the remaining group is a C₁-C₂₀ alkyl group, a C₂-C₂₀ alkylene group, or a C₆-C₂₀ aryl group; and

n is an integer from 0 to 20,



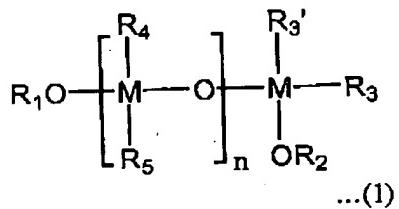
where R_9 is a C₁-C₂₀ alkyl group, a C₁-C₂₀ alkyl group with a hydroxy group, a C₁-C₂₀ hydroxyalkyl group with a hydroxy substituent, or $-(CH_2)_kCOOH$, where k is an integer from 1 to 10, and



where R_{10} is a C₁-C₂₀ alkyl group; R_{11} and R_{12} are, independently, a C₁-C₂₀ alkyl group, a C₁-C₂₀ alkoxy group, or a C₁-C₂₀ alkyl group with a mercapto group; and R_{13} is a C₁-C₂₀ alkyl group with a mercapto (-SH) group, wherein the mercapto compound of said formula (3) or (4) is at least one selected from the group consisting of 3-mercaptopropyltrimethoxysilane, 3-mercaptopropylmethyldimethoxysilane, 3-mercaptop-1,2-propanediol, 1-mercaptop-2-propanol, 3-mercaptopropionic acid, di-(3-mercaptopropyl)dimethoxysilane, and tris-(3-mercaptopropyl)methoxysilane.

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38. (Previously Presented) A transparent conductive layer comprising a conductive layer containing a metal oxide and a protective layer and spray-coated layer sequentially formed to protect the conductive layer, the spray-coated layer containing a hydrolyzed and polycondensated product of a metal compound of formula (1) below, at least one of fluoroalkylsilane of formula (2) below and its hydrolyzed and polycondensated product, and at least one of a mercapto compound of formula (3) or (4) below and its hydrolyzed and polycondensated product, and the protective layer containing a hydrolyzed and polycondensated product of the metal compound of said formula (1):

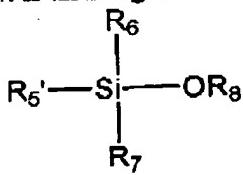


where M is selected from the group consisting of Si, Ti, Sn, and Zr;

R₁ is a C₁-C₂₀ alkyl group or -M(R₁₄R₁₅R₁₆) where R₁₄, R₁₅, and R₁₆ are, independently, a C₁-C₂₀ alkyl group, a C₁-C₂₀ alkoxy group, or a C₆-C₂₀ aryl group;

R₂ is a C₁-C₂₀ alkyl group; at least one of R₃ and R_{3'} is a C₁-C₂₀ alkoxy group, and the remaining group is a C₁-C₂₀ alkyl group, a C₁-C₂₀ alkoxy group, a C₂-C₂₀ alkylene group, or a C₆-C₂₀ aryl group; at least one of R₄ and R₅ is a C₁-C₂₀ alkoxy group, and the remaining group is a C₁-C₂₀ alkyl group, a C₂-C₂₀ alkylene group, or a C₆-C₂₀ aryl group; and

n is an integer from 0 to 20,

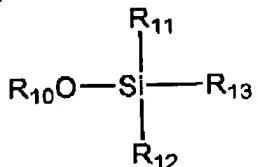


where R_{5'} is a fluorinated C₁-C₂₀ alkyl group; R₆ and R₇ are, independently, a C₁-C₂₀ alkoxy group or a fluorinated C₁-C₂₀ alkyl group; and R₈ is a C₁-C₂₀ alkyl group,

R₉SH ... (3)

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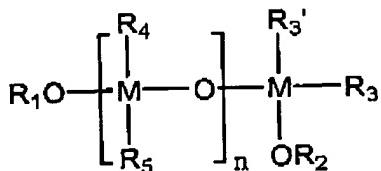
where R_9 is a C_1 - C_{20} alkyl group, a C_1 - C_{20} alkyl group with a hydroxy group, a C_1 - C_{20} hydroxyalkyl group with a hydroxy substituent, or $-(CH_2)_kCOOH$, where k is an integer from 1 to 10, and



... (4)

where R_{10} is a C_1 - C_{20} alkyl group; R_{11} and R_{12} are, independently, a C_1 - C_{20} alkyl group, a C_1 - C_{20} alkoxy group, or a C_1 - C_{20} alkyl group with a mercapto group; and R_{13} is a C_1 - C_{20} alkyl group with a mercapto (-SH) group, wherein the mercapto compound of said formula (3) or (4) is at least one selected from the group consisting of 3-mercaptopropyltrimethoxysilane, 3-mercaptopropylmethyldimethoxysilane, 3-mercanto-1,2-propanediol, 1-mercato-2-propanol, 3-mercaptopropionic acid, di-(3-mercaptopropyl)dimethoxysilane, and tris-(3-mercaptopropyl)methoxysilane.

39. (New) A transparent conductive layer comprising a conductive layer containing a metal oxide and a protective layer formed on the conductive layer, the protective layer containing a hydrolyzed and polycondensated product of a metal compound of formula (1) below and at least one of a mercapto compound of formula (3) or (4) below and its hydrolyzed and polycondensated product:



... (1)

where M is selected from the group consisting of Si, Ti, Sn, and Zr;

R_1 is a C_1 - C_{20} alkyl group or $-M(R_{14}R_{15}R_{16})$ where R_{14} , R_{15} , and R_{16} are, independently, a C_1 - C_{20} alkyl group, a C_1 - C_{20} alkoxy group, or a C_6 - C_{20} aryl group;

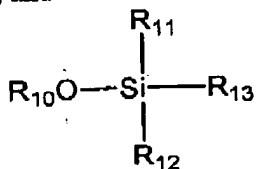
R_2 is a C_1 - C_{20} alkyl group; at least one of R_3 and R_3' is a C_1 - C_{20} alkoxy group, and the remaining group is a C_1 - C_{20} alkyl group, a C_1 - C_{20} alkoxy group, a C_2 - C_{20} alkylene group, or a C_6 - C_{20} aryl group;

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at least one of R₄ and R₅ is a C₁-C₂₀ alkoxy group, and the remaining group is a C₁-C₂₀ alkyl group, a C₂-C₂₀ alkylene group, or a C₆-C₂₀ aryl group; and
n is an integer from 0 to 20,

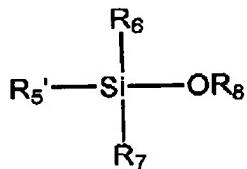


where R₉ is a C₁-C₂₀ alkyl group, a C₁-C₂₀ alkyl group with a hydroxy group, a C₁-C₂₀ hydroxyalkyl group with a hydroxy substituent, or -(CH₂)_kCOOH, where k is an integer from 1 to 10, and



...(4)

where R₁₀ is a C₁-C₂₀ alkyl group; R₁₁ and R₁₂ are, independently, a C₁-C₂₀ alkyl group, a C₁-C₂₀ alkoxy group, or a C₁-C₂₀ alkyl group with a mercapto group; and R₁₃ is a C₁-C₂₀ alkyl group with a mercapto (-SH) group, the transparent conductive layer further comprising, on the protective layer, a non-continuous coating layer containing a hydrolyzed and polycondensated product of the metal compound of said formula (1), at least one of fluoroalkylsilane of formula (2) below and its hydrolyzed and polycondensated product, and at least one of a mercapto compound of said formula (3) or (4) and its hydrolyzed and polycondensated product:

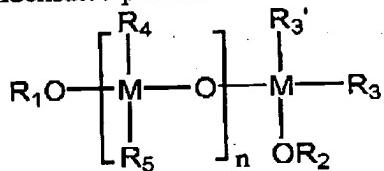


...(2)

where R_{5'} is a fluorinated C₁-C₂₀ alkyl group; R₆ and R₇ are, independently, a C₁-C₂₀ alkoxy group or a fluorinated C₁-C₂₀ alkyl group; and R₈ is a C₁-C₂₀ alkyl group.

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40. (New) A transparent conductive layer comprising a conductive layer containing a metal oxide and a protective layer and a non-continuous coating layer sequentially formed to protect the conductive layer, the non-continuous coating layer containing a hydrolyzed and polycondensated product of a metal compound of formula (1) below, at least one of fluoroalkylsilane of formula (2) below and its hydrolyzed and polycondensated product, and at least one of a mercapto compound of formula (3) or (4) below and its hydrolyzed and polycondensated product, and the protective layer containing a hydrolyzed and polycondensated product of the metal compound of said formula (1):



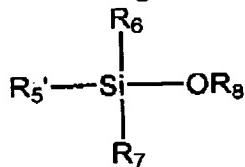
...(1)

where M is selected from the group consisting of Si, Ti, Sn, and Zr;

R₁ is a C₁-C₂₀ alkyl group or -M(R₁₄R₁₅R₁₆) where R₁₄, R₁₅, and R₁₆ are, independently, a C₁-C₂₀ alkyl group, a C₁-C₂₀ alkoxy group, or a C₆-C₂₀ aryl group;

R₂ is a C₁-C₂₀ alkyl group; at least one of R₃ and R_{3'} is a C₁-C₂₀ alkoxy group, and the remaining group is a C₁-C₂₀ alkyl group, a C₁-C₂₀ alkoxy group, a C₂-C₂₀ alkylene group, or a C₆-C₂₀ aryl group; at least one of R₄ and R₅ is a C₁-C₂₀ alkoxy group, and the remaining group is a C₁-C₂₀ alkyl group, a C₂-C₂₀ alkylene group, or a C₆-C₂₀ aryl group; and

n is an integer from 0 to 20,



...(2)

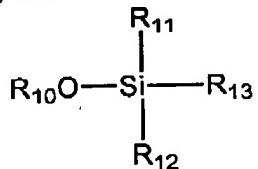
where R_{5'} is a fluorinated C₁-C₂₀ alkyl group; R₆ and R₇ are, independently, a C₁-C₂₀ alkoxy group or a fluorinated C₁-C₂₀ alkyl group; and R₈ is a C₁-C₂₀ alkyl group,

R₉ SH

...(3)

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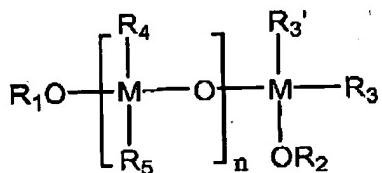
where R₉ is a C₁-C₂₀ alkyl group, a C₁-C₂₀ alkyl group with a hydroxy group, a C₁-C₂₀ hydroxyalkyl group with a hydroxy substituent, or -(CH₂)_kCOOH, where k is an integer from 1 to 10, and



...(4)

where R₁₀ is a C₁-C₂₀ alkyl group; R₁₁ and R₁₂ are, independently, a C₁-C₂₀ alkyl group, a C₁-C₂₀ alkoxy group, or a C₁-C₂₀ alkyl group with a mercapto group; and R₁₃ is a C₁-C₂₀ alkyl group with a mercapto (-SH) group.

41. (New) A transparent conductive layer comprising a conductive layer containing a metal oxide and a protective layer and non-continuous coating layer sequentially formed to protect the conductive layer, the non-continuous coating layer containing a hydrolyzed and polycondensated product of a metal compound of formula (1) below, at least one of fluoroalkylsilane of formula (2) below and its hydrolyzed and polycondensated product, and at least one of a mercapto compound of formula (3) or (4) below and its hydrolyzed and polycondensated product, and the protective layer containing a hydrolyzed and polycondensated product of the metal compound of said formula (1):



...(1)

where M is selected from the group consisting of Si, Ti, Sn, and Zr;

R₁ is a C₁-C₂₀ alkyl group or -M(R₁₄R₁₅R₁₆) where R₁₄, R₁₅, and R₁₆ are, independently, a C₁-C₂₀ alkyl group, a C₁-C₂₀ alkoxy group, or a C₆-C₂₀ aryl group;

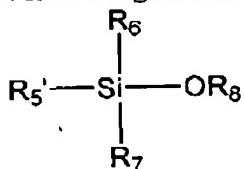
R₂ is a C₁-C₂₀ alkyl group;

at least one of R₃ and R_{3'} is a C₁-C₂₀ alkoxy group, and the remaining group is a C₁-C₂₀ alkyl group, a C₁-C₂₀ alkoxy group, a C₂-C₂₀ alkylene group, or a C₆-C₂₀ aryl group;

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at least one of R₄ and R₅ is a C₁-C₂₀ alkoxy group, and the remaining group is a C₁-C₂₀ alkyl group, a C₂-C₂₀ alkylene group, or a C₆-C₂₀ aryl group; and

n is an integer from 0 to 20,

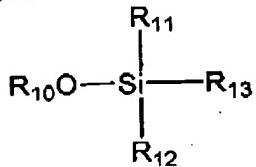


...(2)

where R_{5'} is a fluorinated C₁-C₂₀ alkyl group; R₆ and R₇ are, independently, a C₁-C₂₀ alkoxy group or a fluorinated C₁-C₂₀ alkyl group; and R₈ is a C₁-C₂₀ alkyl group,

R₉ SH ... (3)

where R₉ is a C₁-C₂₀ alkyl group, a C₁-C₂₀ alkyl group with a hydroxy group, a C₁-C₂₀ hydroxyalkyl group with a hydroxy substituent, or -(CH₂)_kCOOH, where k is an integer from 1 to 10, and



...(4)

where R₁₀ is a C₁-C₂₀ alkyl group; R₁₁ and R₁₂ are, independently, a C₁-C₂₀ alkyl group, a C₁-C₂₀ alkoxy group, or a C₁-C₂₀ alkyl group with a mercapto group; and R₁₃ is a C₁-C₂₀ alkyl group with a mercapto (-SH) group, wherein the mercapto compound of said formula (3) or (4) is at least one selected from the group consisting of 3-mercaptopropyltrimethoxysilane, 3-mercaptopropylmethyldimethoxysilane, 3-mercato-1,2-propanediol, 1-mercato-2-propanol, 3-mercaptopropionic acid, di-(3-mercaptopropyl)dimethoxysilane, and tris-(3-mercaptopropyl)methoxysilane, and the mercapto compound is contained in an amount of 1-15 parts by weight based on 100 parts by weight of the metal compound of said formula (1).